

# Facilities Quarterly

ERNEST ORLANDO LAWRENCE BERKELEY NATIONAL LABORATORY ♦ FACILITIES DEPARTMENT NEWSLETTER

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2000

## NEW CONSTRUCTION EASES ALS SPACE CRUNCH

The Advanced Light Source has been even busier than usual lately. In addition to the quiet, if intense, work of science on the experimental floor, there is dust and din on the second floor, as iron workers install new

structural steel for the final phase of the second-floor buildout.

On our way to look in on construction activities, Joe Harkins, who is coordinating construction for the ALS, points out some new developments on the first floor: four beamlines under construction, and others, still in design, marked out on the floor in masking tape. All told, eight new beamlines are in design or construction. In the middle of some of the taped-off areas stand pieces of experimental equipment. Harkins explains that these are staging areas, soon to be eliminated to make way for the new beamlines and experimental stations.

In the construction area on the second floor, what's visible now is a curve of bare walls encompassing about half the circumference of the ALS. Over the next year and a half, this space, which looks out over the experimental floor, will be transformed into 19 offices, three semi-clean rooms, two dry labs, two wet labs, two lounge areas, a computer room/library, a freight elevator, and a mechanical room. All told, the \$4.8 million project will build out approximately 12,000 square feet (1,100 square meters) of laboratory, office, and research support space, completing construction of the second floor. Previous projects developed the rest

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*A worker installs steel for the new lounge area at the ALS. Second-floor construction will provide 19 offices, as well as clean rooms, labs and other user support facilities. (Photo by Roy Kaltschmidt)*

## NEW BUILDING SIGNS SHOW THE WAY

For veterans and visitors alike, Berkeley Lab's building numbers can seem as predictable as a bingo game. Facilities Planning has finally brought some sense to the confusion, though, with the installation of hundreds of new, clearly visible building number signs, prominently positioned on the exteriors of all Lab buildings.

The distinctive, round signs, which were produced in Facilities' state-of-the-art sign shop

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## ALS

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of the second floor for structural biology, combustion dynamics, the User Office, and the main lobby.

The new addition couldn't be more timely. As space on the first floor is developed for the beamlines themselves, less and less space is available for assembly of end-station experiments and beamline equipment—even as the

demand for such staging areas is increasing. "The need for this space is very, very great, as staging areas on the experimental floor are being eliminated as more beamlines are built," says Harkins. The three semi-clean rooms will provide the low-dust environment needed for staging of experiments. The offices, laboratories, and other amenities will serve a lengthening roster of ALS users.

On the subject of dust, Project Manager Richard Stanton is taking special

precautions to minimize the impact of this major construction project on ALS operations. Temporary walls have been built where construction interfaces the experimental floor, and plastic sheeting is being used to screen off dust-generating activities. The most disruptive construction, such as installation of the freight elevator, will take place during scheduled beamline outages.

Construction is being carried out in three phases. The first phase, which began last June and is scheduled for completion this month, includes strengthening of the roof to hold mechanical equipment, installation of structural steel for floor space in two of the building's full-height alcove areas, and construction of a stairway for roof access. The second phase began in December and will continue through this year. It will include mechanical and electrical rough-in, the elevator, and a portion of the labs and offices. The last phase is scheduled to begin in October 2000 and includes the remaining labs and offices. Project completion is scheduled for early 2001.



## FROM THE FACILITIES MANAGER...

**W**e are entering an era with a new set of numbers. Some call it the twenty-first century, others say that won't happen until 2001. We won't even bring up the problems with changing from the Gregorian to the Julian calendar; or the fact that Chinese, Japanese, Hebrews, Native Americans, and many others keep a different calendar.

It is a good time, however, to look back over the past few years to see how we have changed and where we should go in the future. We arrived where we are through the hard work, initiative, and imagination of a lot of people. The ones that saw the opportunities luckily were strong enough to bring the rest (sometimes kicking and screaming) along to a better way of doing our jobs. We've grown as a department both in size and capability. As new groups joined us, they were made part of the whole and made Facilities better for the skills and talents they brought with them.

Some of the highlights are the various teams that worked to implement MAXIMO modules and change our business rules, and the committees that took the Behavior Based Accident Prevention Program and in two short years surprised even the professionals with the quality of the Worker's Observing Workers performance. Fiscal year 1999 marked our fourth year in a row that we received an Outstanding from DOE Oakland for Facilities Management. This past year also marked significant improvement in performance measures for other department functions included in measures other than Facilities Management.

As we enter this new era, let each of us set new, higher goals for service to the Laboratory and for a safer place to work.

I wish each of you the happiest of New Years.

**Bob Camper**

Work SMART...

WORK SAFELY...

If it is not safe, STOP the work.

## IN PROGRESS

*continued from page 5*

mission. Other improvements will include new sound baffles and building architectural and electrical system upgrades. (Lonny Simonian, x6088)

### JGI Production Sequencing Facility

Construction of the tenant improvements for this fast-track project is complete. User outfitting with lab benches, equipment hookups, etc., has begun and is scheduled for completion in May 2000. (Kirk Haley, x5973)

### Berkeley Computing Facility

Design and construction are underway for 1,000 sq m (11,000 sq ft) of computer and support space, and 700 sq m (7,000 sq ft) of office space. The new facility will be located at 415 20th St in downtown Oakland. (Dave Tudor, x4171)

## FACILITIES DEPARTMENT

Facilities provides Berkeley Lab with a full range of architectural and engineering, construction, and maintenance services for new facilities and for modification and support of existing facilities.

Architectural and engineering services include facility planning, programming, design, engineering, project management, and construction management. Maintenance and construction functions include custodial, gardening, and lighting services; operation, service, and repair or replacement of equipment and utility systems; and construction of modifications, alterations, and additions to buildings, equipment, facilities, and utilities. Additional services include bus

and fleet management, mail distribution, stores distribution, property management, property disposal, cafeteria operations, and electronics repair.

Ongoing Facilities activities include renewal and upgrade of site utility systems and building equipment; preparation of environmental planning studies; in-house energy management; space planning; and assurance of Laboratory compliance with appropriate facilities-related regulations and with University and DOE policies and procedures.

The Work Request Center expedites facility-related work requests, answers questions, and provides support for facility-related needs.

## FOCUS ON SERVICE: Mechanical/IHEM

With our new-millennium concern for the earth and the environment, designing, building and operating energy-efficient facilities has never had a higher priority. Reducing Berkeley Lab's energy consumption has been, for many years, the job of Facilities' In House Energy Management (IHEM) group. Since the mid-1980's, IHEM has brought significant energy savings to Berkeley Lab, providing controls engineering for all construction projects, enforcing state and federal energy efficiency requirements, carrying out retrofit studies, performing use analysis and recharge, and enhancing employee energy awareness.

Two years ago, IHEM merged with the Mechanical Engineering group, which was responsible for planning, designing, and supporting construction of mechanical and control systems within Lab buildings, including heating, ventilation, and air conditioning (HVAC), natural gas, compressed air, low conductivity water (LCW), sewers, acid waste disposal, lighting, and fire-protection. This move has resulted in the integrated application of Facilities' energy management and mechanical system

engineering capabilities to all Berkeley Lab's conceptual design, study, construction, and maintenance projects—as well as to day-to-day facility operations.

The combined Mechanical/IHEM group has broad energy-management responsibilities for all Berkeley Lab's mechanical infrastructure systems. Ensuring compliance with statutory requirements, it enforces all applicable federal, DOE, and State of California energy-efficiency laws, orders, and codes. It supplies mechanical and controls engineering for all new Lab construction projects, and carries out energy-efficiency studies for retrofit projects aimed at reducing Lab energy consumption. Working closely with Berkeley Lab clients, the Mechanical/IHEM group also develops mechanical specifications for buildings and, when off-the-shelf solutions are appropriate, advises clients on what systems to buy.

Mechanical/IHEM maintains a vigorous Lab-wide energy management program, saving energy and money

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## COMPLIMENTS

David West, a staff scientist in the Life Sciences Division, reports that Joseph Cullen “did an absolutely fabulous job” of painting Donner 216. Says Dr. West, “The work that Joseph did brightened up the room so much, and he did such a good job, that I now look forward to moving in and making it a functional laboratory.”

John Stoner of Archives and Records received “excellent service” from Ron Woods and his move team during a recent move in Building 69. “They were always willing to go the extra mile to help us deal with what was often a difficult transition and were (amazingly) always cheerful about it.”

Glenn Garabedian of EH&S writes of “the tremendous cooperation that my group has gotten from Kevin Trigales and his [rigging] crew...When we recently transferred over 400 tons of activated shielding blocks from 903 to Brookhaven, their performance was excellent. They were very safety oriented, innovative, and extremely competent.”

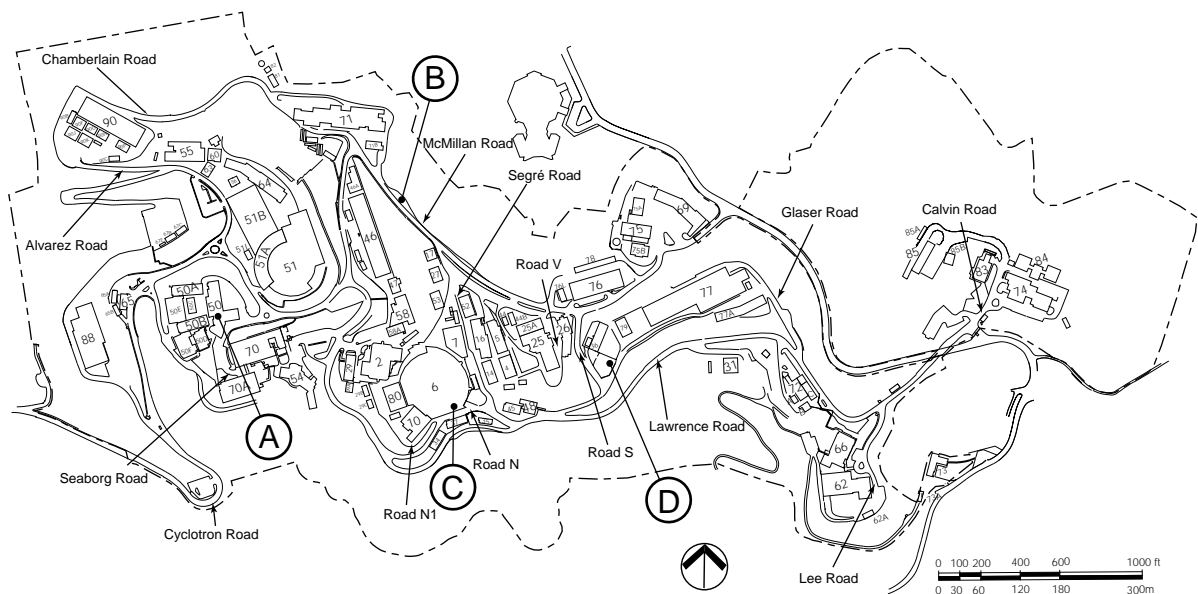
## WORK REQUEST CENTER

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WRC welcomes questions or comments about Facilities Quarterly.

# CONSTRUCTION AND YOU

Current construction projects affecting parking, or vehicular or pedestrian circulation



**Project Contacts.** The name in parentheses after each project is the Project Manager (PM) or other person who is responsible for project oversight: coordinating all phases from design through construction; controlling cost, scope and schedule; and ensuring client satisfaction. This person will be happy to answer any questions about the project.

**Bldg 50: Chiller and Cooling Tower Replacement**

<b>A</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>
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Construction is scheduled to start in late January on the roof of Building 50. The contractor laydown area and crane location for two to three days of hoisting operations is in the process of being identified. (Lonny Simonian, x 6088)

**Blackberry Switching Station**

<b>B</b>	<b>JAN</b>	<b>FEB</b>	<b>MAR</b>
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The contractor will continue to occupy the laydown area on McMillan Road until May 2000. Lab employees can expect intermittent traffic delays near the intersection of McMillan Rd, Cyclotron Rd, and Lawrence Rd until April 2000. (Chuck Taberski, x6076)

**Bldg 6: 2nd Floor Office & Lab Buildout**

<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>C</b>
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Parking spaces along the south side of Bldg 6 will be reserved for contractor use. (Richard Stanton, x6221)

**UC Hill Area Substation**

<b>JAN</b>	<b>FEB</b>	<b>MAR</b>	<b>D</b>
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UC Berkeley is constructing a new electrical substation at the corner of S Road and Glaser Road. Construction will be limited to the actual site of the substation itself, but Lab employees can expect slow-moving construction vehicles and occasional closures of Glaser Road while the contractor is installing underground duct banks and electrical-equipment supporting structures on the down-slope side of Glaser Road. Construction is scheduled to be completed by March 2000. (Chuck Taberski, x6076)

**“CAUTION—CONSTRUCTION AREA”**

Construction barricades and warnings are there for your protection. Under no circumstances should you cross a construction barricade, or disobey posted warnings or directions. Contact the Project Manager for escorted access to construction areas.

## ON THE DRAWING BOARD

*projects in study or conceptual design*

### Rehabilitate Site Mechanical Utilities, Phase 2

This project will extend the useful lives of the natural gas, low conductivity water (LCW), compressed air, and storm drain systems. All steel pipe and service risers in the natural gas system will be replaced with nonmetallic pipe. LCW system aluminum pipe will be replaced with stainless-steel pipe. Cathodic protection will be added to the compressed air system. Steel pipe in the storm drain system will be replaced or relined. Facilities is now preparing a conceptual design report for FY2002 funding consideration. (Lonny Simonian, x6088)

### Sitewide Water Distribution Upgrade, Phase 1

Much of Berkeley Lab's fresh-water supply system has been in place for over 30 years. This project will replace about 0.9 mile (1.5 km) of cast iron pipe and

upgrade the remaining 5 miles (8 km) of pipe with corrosion protection, new valves, pressure reducing stations, improvements to an existing water storage tank, and a new water storage tank in the East Canyon area. Facilities has prepared an updated conceptual design report for FY 2001 funding consideration. (Charles Allen, x6438)

### Operations Building

Conceptual design is underway for a multiple-use building for Operations. The new structure is planned at approximately 2300 sq m (25,000 sq ft). (Richard Stanton, x6221)

## IN PROGRESS

*funded projects*

### Bldg 88: Seismic Anchoring

Architectural and engineering conceptual design has begun to seismically reinforce caves 1 through 5. Final design will identify specific caves for construction later this year. (Lonny Simonian, x6088)

### Bldg 75: Lab Modifications

Architectural and engineering design will begin in early January to provide a new glove box collector system and a new fume hood collector system. This is the first phase of a three-phase project. (Lonny Simonian, x6088)

### Bldg 2: HVAC Upgrade

Design has started on upgrading air handler units 1 through 4 and modifying mechanical equipment and controls to correct heating, ventilation, and air conditioning deficiencies. (Lonny Simonian, x6088)

### Blackberry Canyon Switching Station Replacement

Cable and equipment installation is in progress. The Blackberry Switching Station upper slab is complete and ready to receive the switching station. The contractor continues the slow process of installing the

12 kV feeders. During this phase of construction, manholes in the street will be opened and flaggers will direct traffic into single lanes at various times. No roads will be closed. Contract completion is scheduled for the early spring of 2000. (Chuck Taberski, x6076)

### Bldg 6: Laboratory and Office Buildout

This project will build out approximately 1,100 sq m (12,000 sq ft) of laboratory, office, and research support space in the existing unfinished area on the second floor of Building 6. (Richard Stanton, x6221)

### Bldg 62: Third-Floor Alterations and Moves

Modifications to the third floor of Building 62 are underway to convert the space for use by the Engineering Division. (Richard Stanton, x6221)

### Bldg 77: Rehabilitation of Building Structure and Systems

The Architect/Engineers are completing final design. This project will arrest differential settlement of Building 77, replace building cross bracing, and realign bridge crane runways. Upgrades to the building HVAC system and addition of thermal insulation will improve temperature controls, supporting the building's precision-engineering

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## MECHANICAL/IHEM

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by applying energy-efficient technology and practices at Lab facilities. Over the last 14 years this program has reduced energy consumption at the Lab by almost 35% (on a BTU/GSF basis), an average annual savings of over \$1.7 million in energy costs. Two of Mechanical/IHEM's 1999 energy-conservation projects, New Lighting Technologies and Small Fan Controls, recently won awards from DOE. These projects successfully reduced the annual runtime hours of over 30 exhaust fans and increased the energy efficiency of over 2,000 lighting fixtures. This reduction, along with the redesign of office-area fixture placements and replacement of low-efficiency lamps, has produced an annual savings of almost \$43,500 for the Lab, while reducing pollution from power plant emissions by an estimated 3,900 tons of CO<sub>2</sub>, SO<sub>2</sub>, and NO<sub>x</sub> annually.

Retrofits to existing mechanical systems are another source of energy savings. Berkeley Lab's buildings range from temporary office trailers to specialized laboratory buildings to large multilaboratory structures (with complex HVAC requirements). Mechanical/IHEM designs retrofits to lighting and motor-driven systems, chiller plants, laboratory ventilation, and improved energy monitoring and control systems (EMCS) to fit the needs of individual buildings.

Environmentally sensitive design will be a big part of future building projects at Berkeley Lab. At present, Mechanical/IHEM is preparing the mechanical conceptual design for the proposed Operations Building (see page 5 of this issue). The Operations Building will be a showcase of "green" building design and a prototype for future construction at Berkeley Lab. Planned

features include such energy-efficient measures as high insulation values, a high albedo roof coating, natural lighting through skylights and light shelves, spectrally selective low-e insulating glass (with u-value and solar heat gain optimized for each exposure direction), under-floor air supply, natural convection-assisted low-pressure ventilation, individual-preference and occupancy-based ventilation and temperature controls, and indirect-direct evaporative cooling. The building will also use a high percentage of recycled steel as well as recycled materials in building panels, carpeting, fabric, tiles, and other elements.

To increase its own efficiency, Mechanical/IHEM is now converting the sitewide EMCS within all Lab buildings to a Windows-based monitoring and control system called Metasys, designed by Johnson Controls, Inc. This is the second year of a five-year program for complete installation. If you haven't noticed this being done, that's good! As Project Manager Charles Taberski states, "We would like to make this conversion without the building occupants knowing we were there and then have them ask us why the temperature control has improved in their building."

All new projects are being designed to employ the JCI Metasys for the EMCS. According to Doug Lockhart, Mechanical/IHEM group leader, "Whenever we have renovations to do in a building, we install the new system as part of the renovation. Not only is it easier to use (with its graphics-based operator workstation), but it also provides us with greater flexibility of component selection, streamlines the engineering process, and reduces cost."

## BUILDING SIGNS

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(see FQ 10/98), are designed to be consistent with the Lab's other new interior and exterior signage. They are from 450 mm to 750 mm in diameter, with the building number in white against a muted brown, blue, or green field. The signs are located on several sides of most buildings, with some buildings having as many as eight signs. According to Planning's Laura Chen, the main idea was to make the buildings identifiable from all major roadway and pedestrian approaches. Here's a tip to avoid circumnavigation of buildings in search of the entrance: Signs with an outer ring mark the side of the building that has the main entrance (see figure).



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